CLAIMS

1. A process for recovering copper from an alkaline, preferably ammoniacal, etch bath from an etching process in which printed boards electroplated with copper are etched with the alkaline etch bath and then rinsed with water, copper being removed from the alkaline etch bath by extraction with an organic solution containing a reagent, which forms with copper a complex compound, which is extracted by the organic solution, the alkaline etch bath being recirculated to renewed etching, the copper-containing organic solution being contacted, in a re-extraction step, with an aqueous solution of an acid, preferably sulphuric acid, so that copper passes from the organic solution to the aqueous solution, and the organic solution being recirculated from the re-extraction step to renewed extraction, characterised by the steps of passing the copper-containing acid solution obtained from the re-extraction step to a copper recovery operation, preferably for producing metallic copper by electrolysis, diverting a flow from the copper-containing acid solution before the operation for recovering copper from the same and adjusting the copper content of said flow so that it will be lower than the copper content of the acid solution which is used in the copper recovery operation, and recirculating said flow having an adjusted copper content to the operation for electroplating printed boards for use therein.

2. A process as claimed in claim 1, characterised by also removing copper from the rinsing water from the etching process by extraction with an organic solution containing a reagent, which forms with copper a complex compound which is extracted by the organic solution.

3. A process as claimed in claim 2, characterised by using the same organic solution for the rinsing water as for the alkaline etch bath and first re-

moving copper from the alkaline etch bath, then contacting the thus obtained copper-containing organic solution with the rinsing water and subsequently subjecting the organic solution to said re-extraction.

4. A process as claimed in claim 1, c h a r a c t e r i s e d by using the same organic solution for the rinsing water as for the alkaline etch bath and first removing copper from the rinsing water, then contacting the thus obtained copper-containing organic solution with the alkaline etch bath and subsequently subjecting the organic solution to said re-extraction.

5. A process as claimed in any one of the preceding claims, c h a r a c t e r i s e d by carrying it out as a closed process, in which the plated printed board is etched with said alkaline etch bath and the acid solution from the plating is used for said re-extraction step.

6. A process as claimed in any one of the preceding claims, c h a r a c t e r i s e d by adjusting the copper content so that the ratio of copper content of said flow:copper content of said acid solution is > 0.3:1, preferably > 0.5:1.

7. A process as claimed in claim 6, c h a r a c t e r i s e d by adjusting the copper content so that the ratio is in the range of 0.60:1 - 0.95:1, preferably 0.75:1 - 0.95:1.

8. A process as claimed in any one of the preceding claims, c h a r a c t e r i s e d by carrying out the plating in the form of pulse plating with wave-shaped, preferably square pulses of current intensity.

9. A process as claimed in any one of the preceding claims, c h a r a c t e r i s e d by carrying out the plating in the form of pulse plating with pole reversal.

10. A process as claimed in claim 8 or 9, c h a r a c t e r i s e d by carrying out the pulse plating with a pulse length of the wave-shaped pulses in the range of 1-500 ms, preferably 10-50 ms.

11. A process as claimed in any one of claims 8-10, characterised by adjusting the period of time during which the printed board acts as cathode in the pulse plating to a value in the range of 1-200 s, preferably 10-100 s.

12. A process as claimed in any one of claims 8-11, characterised by adjusting the period of time during which the printed board acts as anode in the pulse plating to a value in the range of 0.1-20 s, preferably 1-10 s.

13. A process as claimed in any one of claims 8-12, characterised in that the maximum current intensity during the period of time when the printed board acts as cathode in the pulse plating is 10 A/dm^2, preferably 5 A/dm^2 and most preferably 3 A/dm^2.

14. A process as claimed in any one of claims 8-13, characterised in that the maximum current intensity during the period of time when the printed board acts as anode in the pulse plating is 40 A/dm^2, preferably 10 A/dm^2 and most preferably 5 A/dm^2.

15. A process as claimed in any one of the preceding claims, characterised by adjusting the copper content of the flow which is recirculated to the plating by the addition of acid from the re-extraction step.

16. A process as claimed in any one of the preceding claims, characterised by adjusting the copper content of the flow which is recirculated to the plating to a value in the range of 5-100 g/l, preferably 10-50 g/l.

17. A process as claimed in claim 16, characterised by adjusting said copper content to a value in the range of 15-30 g/l, preferably 20-25 g/l.

18. A process as claimed in any one of the preceding claims, characterised by adjusting the content of anion from the used acid, preferably sulphuric acid, to a value in the range of 25-250 g/l, preferably 50-200 g/l, in the flow which is used in the plating.

19. A process as claimed in any one of the preceding claims, c h a r a c t e r i s e d in that the content of anion from the used acid is substantially the same in the copper recovery operation as in the plating operation.

20. A process as claimed in any one of claims 8-19, c h a r a c t e r i s e d by carrying out the pulse plating without any additives of the kind which is used in non-pulse plating of printed boards.

21. A process as claimed in any one of the preceding claims, c h a r a c t e r i s e d by reducing the content of alkaline substance, preferably ammonia, originating from the etch bath and/or reducing the content of organic material originating from the extraction in the flow which is recirculated to the plating before subjecting the same to said plating.

22. A process as claimed in claim 21, c h a r a c t e r i s e d by carrying out said reduction(-s) by means of one or more separate water washing steps in connection with the equipment which is used for the extraction.

23. A process as claimed in claim 21 or 22, c h a r a c t e r i s e d by carrying out said reduction(-s) by means of one or more filters, preferably charcoal filters and/or ultrafilters.

24. A process as claimed in any one of the preceding claims, c h a r a c t e r i s e d by removing colloidal copper before the plating, preferably by means of one or more filters, in particular ultrafilters, from the flow which is recirculated to the plating.

25. A process as claimed in any one of the preceding claims, c h a r a c t e r i s e d by using as equipment for said extraction one or more extractors of the type in which the separation takes place by means of energy supplied from the outside.